



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/664,942      | 09/19/2000  | Christine A. Smith   | IL-10623            | 5232             |

7590

03/12/2003

Christopher J Horgan  
Assistant Laboratory Counsel  
Lawrence Livermore National Laboratory  
P O Box 808 L 703  
Livermore, CA 94551

EXAMINER

ZIMMERMAN, GLENN

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 03/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/664,942

Applicant(s)

SMITH ET AL.

Examiner

Glenn Zimmerman

Art Unit

2879

-- **Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 1-13 and 29-43 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23, 24 and 45 is/are allowed.
- 6) ☒ Claim(s) 10, 14-22, 25-28, 44 and 46-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-53 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

Applicant's election with traverse of Group II in Paper No. 7 is acknowledged. The traversal is on the ground(s) that the search and examination could be made without serious burden MPEP 803. This is not found persuasive because separate statutory classifications of invention, and the different fields of search, are indicia of an undue burden. See MPEP of 803(B) and 808.02.

The requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10, 14-22, 25-28, 44 and 46-53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 14, 15 and 44 are rejected for depending from non-elected claims. These three claims must be rewritten to include all of the limitations of their corresponding non-elected independent claims.

In claim 10 line 7, the wording "capable of" is used. This is "-able" language which means all that follows that wording might or might not be a limitation, which is indefinite.

In claim 16 line 4, the wording “capable of” is used. This is “-able” language which means all that follows that wording might or might not be a limitation, which is indefinite.

In claim 17 line 3, the wording “capable of” is used. This is “-able” language which means all that follows that wording might or might not be a limitation, which is indefinite.

In claim 25 line 1, the wording “capable of” is used. This is “-able” language which means all that follows that wording might or might not be a limitation, which is indefinite.

In claim 48 line 2, the wording “capable of” is used. This is “-able” language which means all that follows that wording might or might not be a limitation, which is indefinite.

In claim 49 line 2, the wording “capable of” is used. This is “-able” language which means all that follows that wording might or might not be a limitation, which is indefinite.

In claim 50 line 4, the wording “capable of” is used. This is “-able” language which means all that follows that wording might or might not be a limitation, which is indefinite.

In claim 51 line 4, the wording “capable of” is used. This is “-able” language which means all that follows that wording might or might not be a limitation, which is indefinite.

In claim 52 line 4, the wording "capable of" is used. This is "-able" language which means all that follows that wording might or might not be a limitation, which is indefinite.

In claim 53 line 5, the wording "capable of" is used. This is "-able" language which means all that follows that wording might or might not be a limitation, which is indefinite.

A 112 2<sup>nd</sup> paragraph rejection has been determined for claim 10, as written about above. However, a further evaluation of the claim will be done while interpreting "capable of " as "having".

A 112 2<sup>nd</sup> paragraph rejection has been determined for claim 16, as written about above. However, a further evaluation of the claim will be done while interpreting "capable of emitting" as "emit".

A 112 2<sup>nd</sup> paragraph rejection has been determined for claim 17, as written about above. However, a further evaluation of the claim will be done while interpreting "capable of emitting" as "that emit".

A 112 2<sup>nd</sup> paragraph rejection has been determined for claim 25, as written about above. However, a further evaluation of the claim will be done while interpreting "capable of" as "having".

A 112 2<sup>nd</sup> paragraph rejection has been determined for claim 48, as written about above. However, a further evaluation of the claim will be done while interpreting "capable of" as "having".

A 112 2<sup>nd</sup> paragraph rejection has been determined for claim 49, as written about above. However, a further evaluation of the claim will be done while interpreting “capable of” as “having”.

A 112 2<sup>nd</sup> paragraph rejection has been determined for claim 50, as written about above. However, a further evaluation of the claim will be done while interpreting “capable of emitting” as “emit”.

A 112 2<sup>nd</sup> paragraph rejection has been determined for claim 51, as written about above. However, a further evaluation of the claim will be done while interpreting “capable of emitting” as “emit”.

A 112 2<sup>nd</sup> paragraph rejection has been determined for claim 52, as written about above. However, a further evaluation of the claim will be done while interpreting “capable of emitting” as “emit”.

A 112 2<sup>nd</sup> paragraph rejection has been determined for claim 53, as written about above. However, a further evaluation of the claim will be done while interpreting “capable of emitting” as “emit”.

Claims 15, 17-22, 26-28, 46 and 47 are rejected for depending from a rejected claim.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2879

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al. 98/XThE10.

Regarding claim 14, Smith et al. disclose a material system of claim 1.

Where claim 1 states a method comprising: directing an energy beam (**page 3 line 3 laser annealing**) at a pre-processed composite material (**samples Z1, Z2 or Z3; page 2 line 12**) having a matrix containing a plurality of nanocrystals and a plurality of traps (**page 2 line 18**) to reduce the size of the plurality of nanocrystals and the number of plurality of traps (**page 3 lines 1-10**) to produce a post-processed composite material.

Claim 44 is rejected under 35 U.S.C. 102(e) as being anticipated by Bawendi et al. U.S. Patent 6,501,091.

Regarding claim 44, Bawendi et al. disclose a material system produced by the method of claim 29. Where claim 29 states a method of tailoring white light emission

(col. 6 lines 48-52; col. 3 lines 20-27) from a composite having optical properties using ZnSe nanocrystals comprising: fabricating the ZnSe nanocrystals (claims 1 and 2; col. 3 lines 7-9); incorporating the ZnSe nanocrystals into a matrix to form a composite (claims 1 and 2; col. 3 line 4); and tuning (col. 3 lines 16-27) the optical properties of the composite to a predetermined application.

***Allowable Subject Matter***

Claims 23, 24 and 45 are allowed.

Claims 16, 25 and 48-53 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Claims 15, 17-22, 26-28, 46 and 47 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Regarding claim 16, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests a material system including the combination of all the limitations as set forth in claim 16, and specifically a plurality of nanocrystals; a plurality of first and second traps; and the plurality of nanocrystals, first traps and second traps emit white light in combination when excited could not be found elsewhere in prior art.

Regarding claims 17-22, 46 and 47, claims 17-22, 46 and 47 are allowed for the reasons given in claim 16, because of their dependency status on claim 16.



Regarding claim 23, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests a material system including the combination of all the limitations as set forth in claim 23, and specifically a plurality of nanocrystals designed to emit blue light when excited and having an average particle size of 1 to 20 nanometers a plurality of first traps designed to emit red light when excited and a plurality of second traps designed to emit green light when excited could not be found elsewhere in prior art.

Regarding claim 24, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests a material system including the combination of all the limitations as set forth in claim 24, and specifically a matrix including nanocrystals having particle sizes in the range of 1 to 20 nanometers; and the matrix further including first traps configured to emit red light and second traps configured to emit green light when fluoresced could not be found elsewhere in prior art.

Regarding claim 25, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests a material system including the combination of all the limitations as set forth in claim 25, and specifically a material system having white light emission when excited comprising: a matrix having a plurality of nanocrystals; and the plurality of nanocrystals configured to contribute in the blue spectral range of the white light emission from the quantum confined bandedge emission of the nanocrystals when excited could not be found elsewhere in prior art.

Regarding claims 26-28, claims 26-28 are allowed for the reasons given in claim 25, because of their dependency status on claim 25.

Regarding claim 45, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests a material system including the combination of all the limitations as set forth in claim 45, and specifically a material system configured to produce white light emission when excited comprising: a plurality of ZnSe nanocrystals in a predetermined size designed to optimize the contribution of blue light to the white light emission; and a plurality of traps in a predetermined density designed to adjust the contribution of red and green light to the whit light emission could not be found elsewhere in prior art.

Regarding claim 48, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests a material system including the combination of all the limitations as set forth in claim 48, and specifically a matrix having nanocrystals and having white light emission when fluoresced; and wherein efficiency of the white light emission is approximately in the range of 50 to 90% could not be found elsewhere in prior art.

Regarding claim 49, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests a material system including the combination of all the limitations as set forth in claim 49, and specifically a matrix having nanocrystals and having white light emission when fluoresced; and wherein efficiency of the white light emission is approximately greater than 80% could not be found elsewhere in prior art.

Regarding claim 50, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests a material system

including the combination of all the limitations as set forth in claim 50, and specifically a plurality of nanocrystals; a plurality of first and second traps; and the plurality of nanocrystals, first traps and second traps that emit white light in combination when excited could not be found elsewhere in prior art.

Regarding claim 51, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests an LCD including the combination of all the limitations as set forth in claim 51, and specifically a plurality of nanocrystals a plurality of first and second traps; and the plurality of nanocrystals, first traps and second traps that emit white light in combination when excited could not be found elsewhere in prior art.

Regarding claim 52, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests an LED including the combination of all the limitations as set forth in claim 51, and specifically a plurality of nanocrystals a plurality of first and second traps; and the plurality of nanocrystals, first traps and second traps that emit white light in combination when excited could not be found elsewhere in prior art.

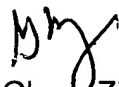
Regarding claim 53, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests an electroluminescent display including the combination of all the limitations as set forth in claim 53, and specifically a plurality of nanocrystals; a plurality of first and second traps; and the plurality of nanocrystals, first traps and second traps that emit white light in combination when excited could not be found elsewhere in prior art.

Art Unit: 2879


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenn Zimmerman whose telephone number is (703) 308-8991. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703) 305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is n/a.



Glenn Zimmerman  
March 9, 2003



ASHOK PATEL  
PRIMARY EXAMINER